



DELTA TAU

TURBO PMAC CLIPPER™

Turbo PMAC2-Eth-Lite Controller



Product Description

PRODUCT DESCRIPTION:

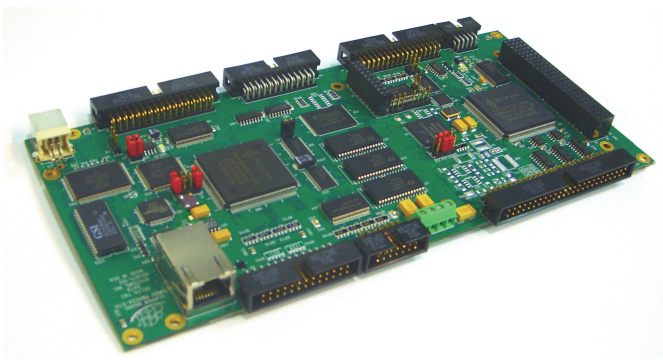
The Turbo Clipper™ controller (Turbo PMAC2-Eth-Lite) from Delta Tau provides a very powerful, but compact and cost-effective, multi-axis controller solution for cost sensitive applications.

The Turbo Clipper is a full featured multi-axis controller with Ethernet (100 Mbit/sec), USB (2.0), and RS232 communication ports and built in I/O. It offers a full Turbo PMAC2-CPU and provides a minimum of four axes of servo or stepper control, a full compliment of motor I/O flags (5 in, 2 out), and 32-digital I/O points.

The Turbo Clipper can be used completely standalone, with occasional commands from a host computer or PLC, or with real-time high-speed streaming of data over the Ethernet link. The Clipper can supply the most demanding of applications at a fraction of the cost previously possible.

For applications ranging from high speed indexing to the most demanding of complex robotics, the Turbo Clipper is the new vehicle of choice.

Turbo PMAC2-ETH-Lite Controller
108mm x 229mm (4.25" x 9.0")



BASE SPECIFICATIONS:

The standard Turbo PMAC2-ETH-Lite Controller provides:

- 4 axes of simultaneous servo / stepper control, expandable with piggyback accessories to 8 axes and beyond
- All axes independent or coordinated in any combination
- Multitasking of up to 16 motion programs and 64 asynchronous PLC programs
- Communications: Ethernet, USB, & RS-232
- Easy-to-use, high-level programming language 128K X 24 SRAM user data memory (programs, variables, tables)
- Linear, circular, rapid, B-spline, Hermite-spline interpolation modes
- Embedded forward and inverse kinematics routines for Non-Cartesian geometries
- True S-curve accel/decel for jerk-limited profiles
- PID/notch/feedforward servo algorithms
- Dynamic multi-move lookahead for robust acceleration control and efficient cornering/contouring
- Coordinate system translation and rotation, 2D and 3D
- Tool-radius compensation
- Hardware position capture and compare circuits for high precision
- On-board G-code execution
- Optional Dual Port Ram for fast NC program execution

OPTIONS:

CPU & Memory Options

- 5C3: - 512Kx24 SRAM, 4Mx8 flash
- 5F3: 240 MHZ CPU, 4Mx8 flash

On-board

- Option 12: Analog to Digital Converters, 2 channels, $\pm 10V$, 12 bit
- Option 15F: Modbus TCP Master/Slave communications

PC-104 plug in

- ACC 1P: 4-channels (5-8) board
- ACC-8ES: 4-channel dual 18-bit true-DAC output board
- ACC-8FS: 4-channel direct-PWM output board
- ACC-8TS: Hi-res analog input interface
- ACC-51S: 2/4-channel high-resolution encoder interpolator board

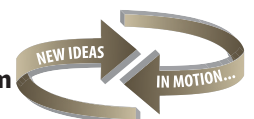
Other (Cabled)

- ACC-34AA: 32 inputs & 32 outputs, optically isolated
- ACC-34B: 32 inputs & 32 outputs, Opto-22
- ACC-65ETH: ModBus , 24 inputs & 24 outputs, isolated
- ACC-8D Option 7: Resolver to Digital Converter

Single Source Machine Control

Power ~ Flexibility ~ Ease of Use

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Specifications and Features

Hardware Features

80 MHz DSP56303 Turbo PMAC CPU
256k x 24 user SRAM
1M x 8 flash memory for user backup & firmware
Latest released firmware version
RS-232 serial interface
100 Mbps Ethernet interface
480 Mbps USB 2.0 interface
4 channels axis-interface circuitry, each including:
12-bit +10V analog output
Pulse-&-direction digital outputs
3-channel differential/single-ended encoder input
5 input flags, 2 output flags
UVW TTL-level "hall" inputs
50-pin IDC header for amplifier/encoder interface
34-pin IDC header for flag interface
4-pin Molex connector for power supply input (5V, +/-12V, GND)
(+/-12V only required for analog outputs or inputs)
PID/notch/feedforward servo algorithms
32 general-purpose TTL-level I/O points, direction selectable by byte:
16-point multiplexer port compatible with Delta Tau I/O accessories
16-point "opto" port compatible with Opto-22-style modules
"Handwheel" port with 2 each:
Quadrature encoder inputs
Pulse (PFM or PWM) output pairs
Dual Ported Ram *

Motion Features

Trajectory Generation
Linear interpolation mode with S-curve accel/decel
Circular interpolation mode with S-curve accel/decel
Rapid point-to-point move mode
Cubic B-spline interpolation mode
Cubic Hermite-spline (PVT) interpolation mode
Automatic move-until-trigger functions with hardware capture
Altered destination on the fly
Interactive jog moves
Multi-move lookahead for velocity and acceleration limiting
Servo
Standard digital PID feedback filter
Velocity, acceleration, and friction feedforward
2nd-order notch/low-pass filter
Gains changeable at any time
Programmable input, integrator, and output limits
Alternate 35-term "pole-placement" servo filter
Alternate user-written high-level "Open Servo" algorithms
Commutation
Sinusoidal commutation of AC servo motors
Vector control of AC induction motors
Digital current-loop closure with direct PWM output (PMAC2)
Compensation
Position compensation tables (1D & 2D)
Torque compensation tables
Backlash compensation
Tool radius compensation
Cartesian geometries
Electronic gearing (no programming required)
Electronic cams with programmable profiles

* Optional

Motion Features (continued)

Safety
Hardware and software overtravel limits
Amplifier enable/fault handshaking
Following error limits
Integrated current limit
Watchdog timer
Program and communications checksums
Computational
Real-time multi-tasking operating system
48-bit floating-point math for user programs
Trigonometric and transcendental functions
Automatic type-matching of different variable types
User-defined pointer variables to any registers
Coordination and Master/Slave
User-defined coordinate systems for auto coordination of axes
Separate coordinate systems for independent motion of axes
Multi-motor axis support (e.g. gantries)
Dynamic axis transformations (e.g. offsets, rotations, mirroring)
User-written forward and inverse-kinematic algorithms for non-Motion Program
High-level programming language for up to 32 axes of control
Automatic sequenced execution of moves
Calculations and I/O synchronous to motion
Axes programmed in user engineering units
Motion values as constants or expressions
Automatic coordination of multiple axes
Ability to execute G-code programs

PLC Features

Execution asynchronous to programmed motion
I/O control as in hardware PLC
Executive functions for standalone applications
Safety and status monitoring
Servo gain scheduling
Data reporting functions
Access to all registers in controller
ModBus I/O control *

Support Feedback types / devices

Digital quadrature encoders
Sinusoidal encoders, interferometers *
Resolvers *
Potentiometers *
LVDT's, RVDT's *
Parallel-format encoders, interferometers *
MLDT's *

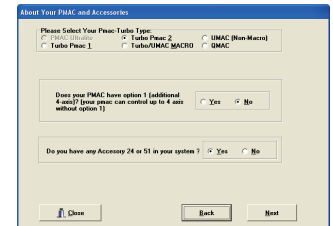
Support Motor types include

Brushless (AC/DC)
DC Brush
Hydraulic Servo
Induction
Linear
Piezzo
Stepper (open / closed loop)
Voice Coil

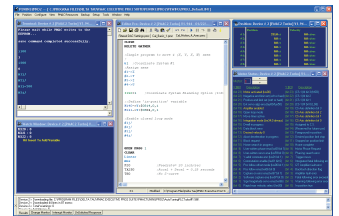
* Optional

Tools and Software

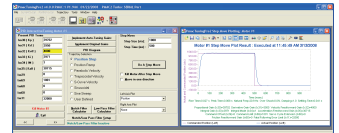
The latest software versions are available on-line at www.deltatau.com for a 30 day free trial



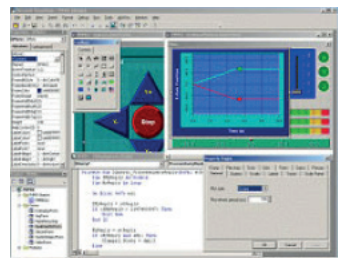
Turbo Setup Pro2 provides wizards that make it easy to setup your Turbo Clipper



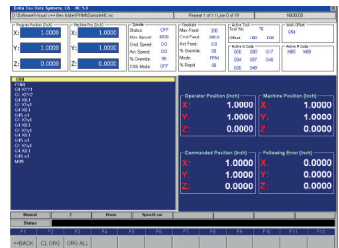
Use the PMAC Executive (**PEWIN**) to: jog motors, issue commands, monitor status & positions, download motion & PLC programs



Tuning Pro2 - use the **Auto-Tuner** to quickly get servo motors moving. Then use the **Interactive Tuning** tool to 'fine tune' servo performance and generate response plots



PMAC HMI - object oriented environment for creating GUI's, includes a wide selection of controls & ActiveX objects



PMAC-NC Pro2 - a Windows-based customizable GUI for PC based CNC control

Turbo PMAC Clipper Ordering Information

4 - 3 8 7 1 A B - 2 0 0 F - 0 H 0 J 0 0

CPU / Memory / Firmware Options

A & B

C0 - OPT-5C0: standard
C3 - OPT-5C3: 512Kx24 SRAM, 4Mx8 flash
F3 - OPT-5F3: 240 MHz CPU, 4Mx8 flash

Communications Options

F

4 - No Options
5 - OPT-2: Dual Ported RAM
6 - OPT-15F: ModBus communications
7 - OPT-2 & OPT-15F: DP Ram & ModBus

Other Options

H

0 - No Options
1 - OPT-12: A/D x 2 (12 bit), D/A (12 bit)

J

0 - No Options
1 - OPT-11A: PWM Laser Control

